

[54] SELF-SERVICE TERMINAL

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G11B 5/00

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360/12; 358/903; 194/DIG. 1, 5, DIG. 6

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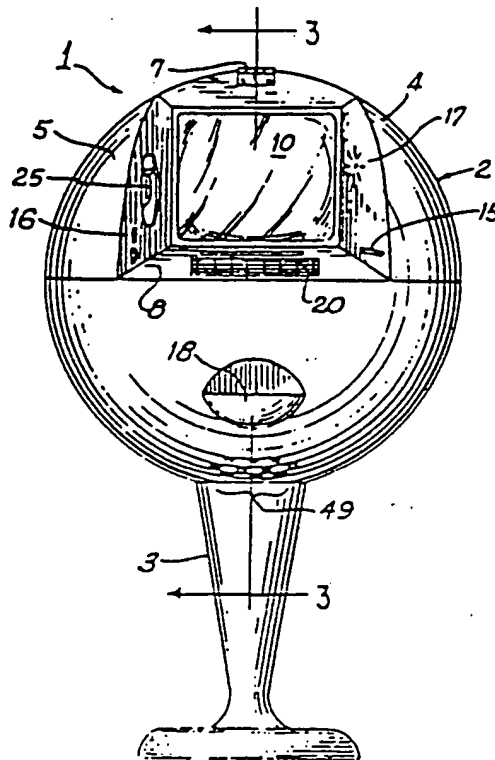
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[57] ABSTRACT

A self service terminal for dispensing voice and video

information, printed documents, and goods; and for accepting service orders and payments therefor by currency or credit card. The terminal comprises a cathode ray tube display with mass storage for presenting information about the product or service sold, a keyboard for entry of customer requests, a printer for delivering coupons and tickets, a vending machine for dispensing small items, a coinbox and credit card reader for accepting payments for goods and services, and a telephone interface for communicating with the staff of a command center. The operation of the terminal is controlled by a microprocessor linked to an automated reservation system. The preferred embodiment of the invention is dedicated to the promotion and sale of travel services. The terminal is operated from three memory devices. A non-volatile memory is used to store the operating program for the terminal. A semi-permanent storage in the form of a video disc is used to hold the travel documentaries and other sales presentations. A randomly accessible mass storage is used to record flight schedules, hotel occupancy and other variables which are periodically updated from the command center via a phone line data communication link. The vending machine is used primarily for dispensing travel brochures, maps, foreign currencies and other goods related to the contemplated travel.

11 Claims, 11 Drawing Figures



EXHIBIT

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FIG. 4

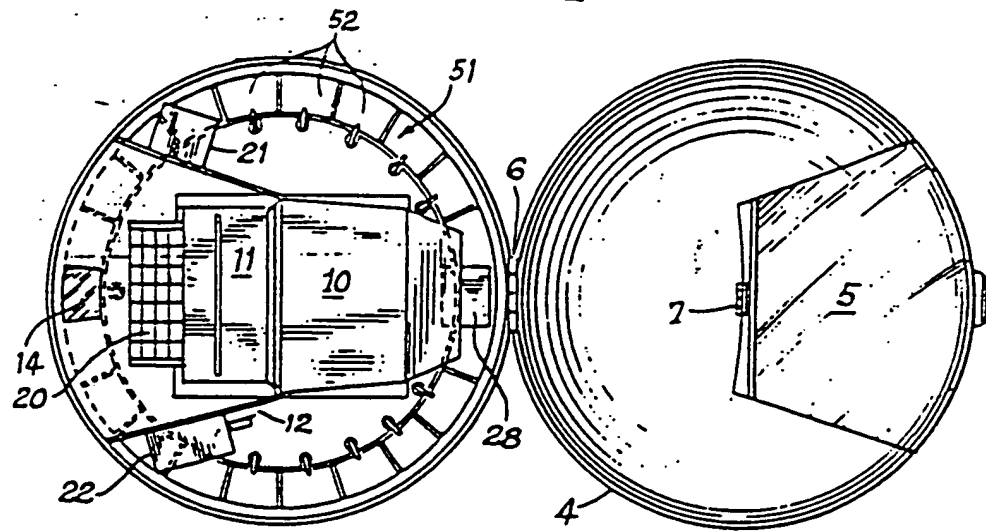
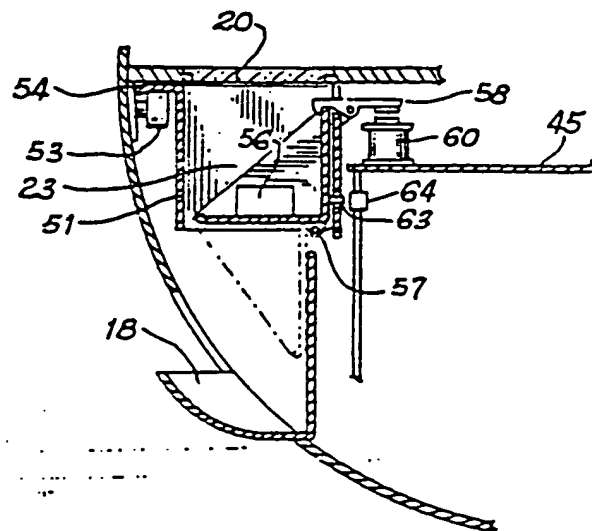


FIG. 5



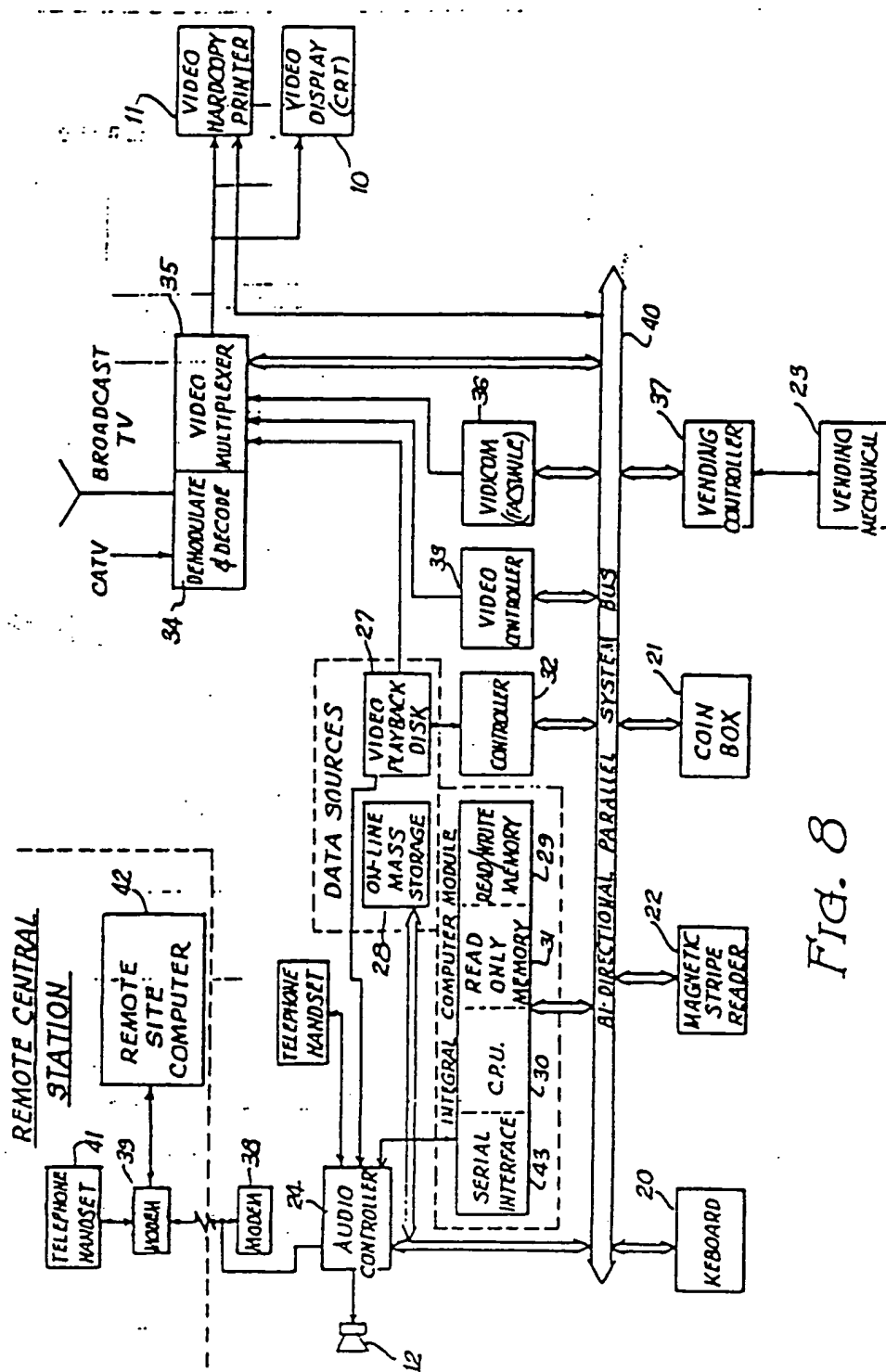
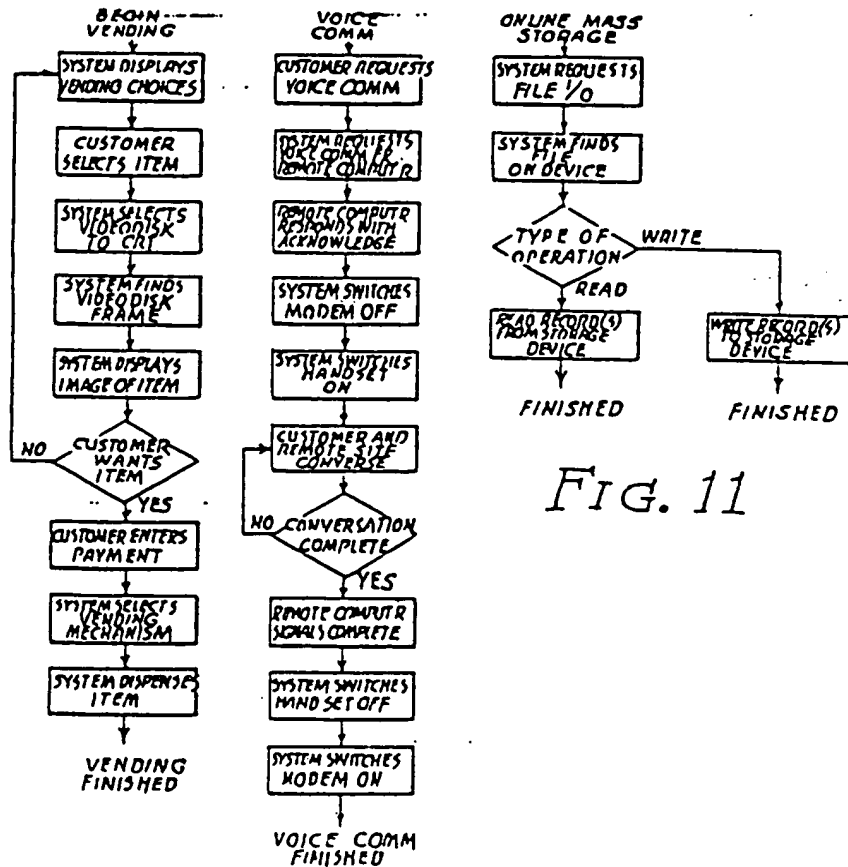


Fig. 8



delivered to the customer through the CRT 10 and the page printer 11. Various items can be delivered by way of the dispenser 23. An audio communication link 24 associated with the telephone hand set 25 and a loud speaker 12 can be used to deliver voice information and to communicate with a remote service center. The processor 30 operates from a variety of data sources 26 as explained below. A more detailed layout of the system is illustrated in FIG. 8.

The present embodiment of the invention is designed to provide travel-related information and services. The first component of the data source 26 is a video storage and playback unit 27 which holds recordings of various travel documentaries promoting tours, cruises, special events, resort facilities and other vacation opportunities. Each documentary is indexed and can be recalled on demand and played on the cathode ray tube 10. A second source of data is provided by a mass storage unit 28 which contains information of a more transitory nature such as flight schedules to various destinations, ticket prices, weather information, snow conditions at various skiing resorts, hotel occupancy status and other information useful in the planning of a business trip or vacation. This information is periodically updated via a communication link 24 with a remote control center. The information contained in the mass storage unit 28 can be selectively displayed in alpha numerical form on the CRT 10. The CRT can also be used to display regular broadcasted television programs as well as scheduled and private cable television productions. Any information or image displayed on the CRT 10 can also be delivered in a hard copy form by a printer 11. All requests for services or information are entered by the customer via the keyboard 20. Payments for the services may be effected either by depositing coins in the coinbox 21 or by charging it to a credit card account after validation of the credit card through the magnetic strip card reader 22. A small number of travel-related goods such as travel guides, maps, sunglasses, foreign currency, may be purchased on the spot by way of the goods dispenser 23.

The good dispenser 23 described with reference to FIGS. 1 through 6, comprises a rotating carousel 51 which surrounds the various elements of the system about the equatorial zone within the enclosure 2. The carousel is divided in a plurality of stations 52 and is supported by a peripheral flange 54 riding over rollers 53 mounted against the skin of the enclosure 2. Each of the stations 52 is open at the bottom and houses a hopper 55 holding one or more items 56 to be dispensed. The hopper 55 has a triangular shape and is supported by a hinge 57 at one of the lower corners of the station. The hopper is held in place by a spring-tensioned latch 58. When the latch 58 is pulled, the hopper 55 rotates downward around hinge 57 and drops the goods 56 into the distribution pouch 18. The latch 58 is released under the pull of a solenoid 60. A single solenoid 60 located on the forward edge of the equipment-supporting shelf 45 guarantees that the goods are always dropped in the distribution pouch 18. The carousel 51 is rotated by means of an electrical motor 61 via a set of gears 62. Each station 52 is identified by a code imbedded in a magnetic strip 63 in the back of each hopper. A sensor 64 located below the solenoid 60 reads identification codes of the stations from the magnetic strips during the movement of the carousel 51. The goods dispenser 23 is operated by means of a vending controller 37 of which FIG. 8 is a functional block diagram.

The electrical motor 61 driving the carousel 51 is energized through driver 70 when the flip-flop FF1 is set upon depressing the SEARCH pushbutton located on the keyboard 20. The flip-flop FF1 will remain set and the carousel will continue to rotate as long as the SEARCH pushbutton is held down. After the search pushbutton has been released, the carousel will stop when flip-flop FF1 is reset as soon as one of the station codes is detected by the code sensor 64 and OR gate 65. This guarantees that the carousel will always stop with a loaded station properly aligned below the viewing window 14 and with its latching lever 58 positioned above the solenoid 60. The coinbox 21 has the ability to generate a code corresponding to the amount of change which has been deposited therein. This information is sent to the central processor 30. The central processor in turn generates a code compatible with the identification code of one or more stations. These stations are presumed to contain goods whose cost is equal to the amount of change recognized by the coinbox 21. If the code of the station which is positioned below the viewing window coincides to the code issued by the central processor, the decoding gates 67 generate a signal which enables AND gate 68. The signal generated by the depressing of DISPENSE pushbutton is routed through gate 68 to set flip-flop FF2. The output of flip-flop FF2 energizes the solenoid 60 by way of driver 69. This causes a release of the latch 58 holding the hopper 55 of the station and the unloading of the goods into the distribution pocket 18. Flip-flop FF2 energizes the solenoid 60 by way of driver 69. This causes a release of the latch 58 holding the hopper 55 of the station and the unloading of the goods into the distribution pocket 18. A COIN ACCEPT signal is generated through gate 66 and sent through the central processor 30 toward the coinbox 21. The COIN ACCEPT signal also resets flip-flop FF2, returning the system to its standby mode.

In order to provide the maximum flexibility in the utilization of the various components of the automatic service terminal and to allow for future expansion, the entire system is managed through the central processor 30. This central processor 30 is used to interpret the complex inputs generated by the customer via the keyboard 20, the coinbox 21, and the credit card reader 22, as well as those generated from the remote site and communicated via the audio communication unit 24. The operating program of the central processor 30 is stored in a non-volatile read only memory 31. This memory contains the programmed code numbers necessary to direct the computer or microcomputer to perform the various functions of the terminal. Intermediate results, variables, etc., required by the operating program, will reside in the read/write memory 29. Both the read only memory 31 and the read/write memory 29 are an integral part with the central processor 30. As implied by the block diagram of FIG. 8, the terminal system employs a bi-directional parallel bus oriented input/output structure. The exact specifications of the bus are typically a function of the central processor and one of the standard types well known by people skilled in the art. The advantage of the bus structure is not only to accommodate the various terminal components, but also to provide for addition of other devices that may be later necessary to support future terminal features. The terminal system is basically a locally controlled device as explained before. A remote interface is also provided for the following features:

the on-line mass storage 28. The application program is of a "menu-type" and can be best understood by reference to the flow diagrams of FIGS. 9, 10 and 11. In order to illustrate the capabilities of the terminal, the operational program will be discussed in connection with five operations: the display of travel documentaries, the display of flight schedules, securing reservations on a particular flight, the issuance of a flight ticket, and the control of the vending machine.

The operation of the terminal is primed by the customer's dropping a dime in the coinbox slot. As explained before, the coinbox generates a coded signal indicative of the amount of change deposited. This signal is immediately sensed by the central processor which addresses the mass storage unit and fetches from it the basic list or menu of the services available. This information is then transmitted via the video multiplexer to the CRT where the list of services available is displayed in columnar form with, adjacent to it the key symbol to be entered by the customer in making its selection. The customer may, for instance, be requested to enter a "D" in order to obtain a listing of all the travel documentaries available. A "S" to check a flight schedule, and so on. Assuming now that the customer enters a "D" on the keyboard, the central processor addresses the video-disc storage unit and fetches from it a list of all documentaries recorded thereon. This list is again routed through the video multiplexer to be displayed on the CRT. The name of the various documentaries are indexed with an alpha-numerical code which the customer is asked to use in making its selection. Once this code is entered via the keyboard, it is used by the central processor to address the video-disc storage to the area containing the selected documentary. After the documentary has been run, the basic menu is again displayed on the CRT and the system is ready for an alternate selection to be made by the customer. If no selection is made within the next thirty seconds, the system returns to a standby status until primed again by deposit of the required change.

The flight schedule program begins by the display on the CRT of a schedule mask through which the customer is invited to fill in the form and to locations of the flights. When the customer enters the departure point and the destination on the keyboard, two codes are generated which are used to seek the appropriate information in the mass storage or, alternately, are sent via the audio communication system to a remote reservation computer. When the list of available flights has been gathered from the mass storage or received back from the remote computer center, it is displayed on the CRT with an inquiry as to whether the customer wants a hard copy of the schedule. The amount of change to be deposited in order to obtain the hard copy is also displayed. When the proper amount of change is detected in the coinbox, the central processor generates a code which is recognized by the printer as a signal to print the raster scan image being generated on the CRT. At the end of the printing sequence the customer is offered the choice to jump immediately into the flight reservation mode or to return to the basic menu display.

The reservation sequence begins with the display of a mask from the CRT requesting such information as the flight number, number of passengers, and other information such as smoking or non-smoking section preferences. After the mask has been completed by the customer entering his selection, the central processor generates a request message which is sent via the audio

communication system to the remote reservation computer. After receiving the confirmation message, the system again offers the customer the option to obtain a hard copy of the reservation information, after which the system offers the option to go directly into a ticket purchase mode, or a return to the basic menu display.

The flight ticket delivery program requires from the customer the payment of the fare through credit card. The price to be paid is fetched upon the mass storage and displayed upon the CRT. The introduction of a credit card into the credit card reader triggers a sequence during which the account number and the amount being charged are sent to a remote credit center where the credit line is verified and the transaction is recorded. The acceptance message received back from the computing center causes the CPU to generate a video image of a flight ticket which is simultaneously printed by the video hard copy printer.

The computer-controlled goods dispensing program is also initiated by a video display of the lists of items available for sale. Upon selection of the item by this alpha-numerical indexing number, the system selects from the video-disc a sequence of images illustrating the product. The customer at that point is offered a choice to purchase the item by depositing the amount indicated, or to return to the item list display mode for an alternate selection. Once the payment has been recognized in the coinbox, the carousel of the vending machine is allowed to rotate until a matching code is detected in the back of the appropriate station, at which point the computer triggers the dispense sequence discussed earlier. Illustrated in FIG. 10 is the flow diagram of a program for establishing a voice communication with a remote site and for the transfer of data between the mass storage and a remote data center. These sequences are of a very common type for which software packages are readily available for most common types of central processors.

The operational sequences just described are illustrative of the versatility of the terminal. The system can be adapted to various tasks related to the delivery of travel services by mere software changes. The terminal could conceivably be used to promote and sell a variety of services and to facilitate financial transactions. Its comprehensive communication interface makes it an ideal tool for catalogue sales from a central warehouse and an adequate substitute in many cases for the retail store. The terminal could also be adapted to the delivery of a higher grade of services such as professional advice and counseling.

While the preferred embodiment of the invention has been described and modifications thereto have been suggested, other implementations may be devised which can be adapted to a variety of applications without departing from the spirit of the invention and the scope of the appended claims.

We claim:

1. An automatic vending apparatus operable by a customer which comprises:
 - means for selectively promoting by audio-visual presentation, the sale of services;
 - means for accepting orders for said services;
 - means for collecting payments for said services;
 - means for ~~delivering to said customer~~ at least one document allowing access to said services;
 - a programmable machine responsive to the request of said customer for directing the operation of said various means;

indicated

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a first data source comprising a first mass-storage means containing product information;
 a second data source comprising a second mass-storage means containing product information and system operation directions;
 electromechanical means for dispensing product;
 means operated by the customer for selecting product to be dispensed by said electromechanical means;
 at least one electromechanical means for printing information derived from said data sources;

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at least one electromechanical means for accepting payment for said product from the customer; and means for directing the operation of said audio-visual means, said means operated by the customer, said data sources and said electromechanical means, said means for directing comprising means for holding an operational sequencing list and a decision-making machine responsive to the status of said various means for controlling their operations.

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